

WHAT IS CLAIMED IS:

1. A method of joining together two planar members, by butting together the two planar members so as to form a joint region therebetween, and performing a friction stir welding operation wherein a rotary tool having a shoulder surface at a bottom end thereof and a probe coaxially provided on the shoulder surface is moved relative to said two planar members such that said probe is rotated with said rotary tool and inserted in said joint region, said method comprising the steps of:

preparing a tab plate having a cutout formed in an end face thereof, such that said cutout has a width which is not smaller than a radius of a peripheral circle to be described by a periphery of said shoulder surface of said rotary tool during rotation of the rotary tool, and a depth which is not smaller than a minimum radius of said probe and not larger than the radius of said peripheral circle of said shoulder surface, said width being measured in a direction parallel to said end face and a direction in which said two planar members are butted together, while said depth being measured in a direction perpendicular to the direction of said width;

positioning said tab plate relative to said two planar members such that said end face is held in abutting contact with end faces of said two planar members which correspond to a terminal portion of said joint region at which said friction stir welding operation is to be terminated, and such that one of opposite ends of said width is located on one side of said joint

region which corresponds to an upstream side as seen in a rotating direction of said rotary tool, as viewed at a leading end of said rotary tool in its direction of movement, and further such that a distance between a terminal end of said terminal end portion of said joint region and said one end of said width is not smaller than zero and not larger than a maximum radius of said probe, while a distance between said terminal end and the other of said opposite ends of said width is not smaller than the radius of said peripheral circle; and

initiating said friction stir welding operation after said tab plate is positioned relative to said two planar members, and terminating said friction stir welding operation after said rotary tool which has been moved to said terminal end of said joint region is further moved across said cutout to a position within an area of said tab plate.

2. The method according to claim 1, wherein said friction stir welding operation is terminated after a trailing end of said rotary tool as viewed in its direction of movement has passed said end face of said tab plate.

3. The method according to claim 1, wherein a thickness of said tab plate as held in abutting contact with said end faces of said two planar members is determined such that an upper surface of said tab plate is located between a first position and a second position which are respectively located below and above upper surfaces of said two planar members, by a distance

equal to 30% of a thickness of said two planar members.

4. The method according to claim 1, wherein a thickness of said tab plate as held abutting contact with said end faces of said two planar members is the same as the thickness of said two planar members.

5. The method according to claim 1, wherein said rotary tool includes a cylindrical body having a constant diameter over an entire axial length thereof and a circular shoulder surface at a bottom end thereof, and said probe in the form of a pin which is coaxially formed on said circular shoulder surface and having a constant diameter over a substantially entire axial length thereof, said width being not smaller than a radius of said cylindrical body, while said depth being not smaller than a radius of said pin and not larger than the radius of said cylindrical body, and wherein said distance between said terminal end of said terminal end portion of said joint region and said one end of said width is not larger than the radius of said pin, while said distance between said terminal end and said other end of said width is not smaller than the radius of said cylindrical body.

6. The method according to claim 1, wherein said tab plate is removed from the joined two planar members after terminating said friction stir welding operation, by one of hand and a wooden hammer.

7. The method according to claim 1, wherein said cutout has a rectangular shape in cross section taken in a plane parallel to the upper surface of the tab plate.

8. The method according to claim 1, wherein said planar members are formed of a material selected from the group consisting of aluminum materials and aluminum alloy materials.

9. The method according to claim 1, wherein two planar members have the same thickness dimension.

10. The method according to claim 1, wherein two planar members have respective different thickness dimensions.

11. A tab plate used in a method of joining together two planar members by butting together the two planar members so as to form a joint region therebetween, and performing a friction stir welding operation wherein a rotary tool having a shoulder surface at a bottom end thereof and a probe coaxially provided on the shoulder surface is moved relative to said two planar members such that said probe is rotated with said rotary tool and inserted in said joint region, and wherein said tab plate is positioned relative to said two planar members such that an end face of said tab plate is held in abutting contact with end faces of said two planar members which correspond to a

terminal portion of said joint region at which said friction stir welding operation is to be terminated, wherein an improvement comprises:

said tab plate having a cutout formed in said end face, said cutout having a width which is not smaller than a radius of a peripheral circle to be described by a peripheral of said shoulder surface of said rotary tool during rotation of the rotary tool, and a depth which is not smaller than a minimum radius of said probe and not larger than the radius of said peripheral circle of said shoulder surface, said width being measured in a direction parallel to said end face and a direction in which said two planar members are butted together, while said depth being measured in a direction perpendicular to the direction of said width.

12. The tab plate according to claim 11, wherein said rotary tool includes a cylindrical body having a constant diameter over an entire axial length thereof and a circular shoulder surface at a bottom end thereof, and said probe in the form of a pin which is coaxially formed on said circular shoulder surface and having a constant diameter over a substantially entire axial length thereof, said width being not smaller than a radius of said cylindrical body, while said depth being not smaller than a radius of said pin and not larger than the radius of said cylindrical body.

13. The tab plate according to claim 11, wherein said tab plate is made of a material which is the same as

the material of the two planar members.

14. The tab plate according to claim 11, wherein said tab plate is made of a material which is different from the material of the two planar members.

15. The tab plate according to claim 11, wherein said cutout has a rectangular shape in cross section taken in a plane parallel to the upper surface of the tab plate.

16. The tab plate according to claim 11, wherein said cutout is defined by three surfaces, and wherein said three surfaces includes a first side surface to be located on one side of the joint region which corresponds to one of two planar members, a second side surface to be located on the other side of the joint region which corresponds to the other planar member, and a bottom surface which extends between the first and second side surfaces and which is to be opposed to the terminal end of the joint region.